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Attorney Docket No. 7594 P1
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REMARKS

35 U.S.C. §103 Rejection

a. Hoots in view of Hoots

Claims 1,2 and 6-18 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Hoots et al. (U.S. Patent No 5,435,969) in view of Hoots (U.S. Patent No. 5,171,450). In pertinent part the Examiner states the following:

> Concerning part c) of claims 1 and 18, the tracer must necessarily travel through the membrane or not pass or travel through the membrane being monitored, this would be determined in advance of the separation process by ensuring that the tracer is such as not be consumed or degraded by the membrane water system being treated or monitored, so as to select a tracer that is assured as being truly inert (column 37, line 60-column 38, line55)...Column 12, lines 9-12 indicate that the membrane being monitored generally removes both suspended material and solutes from the feedwater, hence these substances remaining with the retentate stream and not passing through the membrane. Column 37 teach that the tracer selected must be wholly water-soluble or dispersible in the feed stream, hence generally known to substantially not pass through the membrane and remain with the retentate.

Applicants traverse the Examiner's rejection.

Hoots et al. (U.S. Patent No. 5,435,969) teaches a method of fluorometrically monitoring the amount of water treatment agent(s) added to and in an industrial water system, as well as system consumption of water treatment agent(s) in an industrial water system.

With respect to the amount of water treatment agent(s) added to and in an industrial water system, Hoots et al. teaches that the concentration of a water treatment agent in an industrial water system can be calculated by monitoring an inert fluorescent tracer, which is added to the industrial water system in proportion to the amount of water treatment agent. Because the inert fluorescent tracer and water treatment agent are added in known proportion to one another, the concentration of the inert fluorescent tracer can be correlated with the concentration of the water treatment agent. Hoots et al. also teaches how the concentration of water treatment agent can be determined by use of a water treatment concentration indicator. Combining a water treatment agent and incipient reagent forms a concentration indicator. The concentration indicator is fluorescent and therefore its concentration can be determined by fluorometric means. The concentration of the concentration indicator is then correlated with amount of water treatment agent.

With respect to system consumption of water treatment agent, Hoots et al. teaches that system consumption of a water treatment agent in an industrial water system can be determined by monitoring a water treatment concentration indicator in conjunction with an inert fluorescent tracer. System consumption is determined by the difference between the concentration of the water treatment agent added to the system, as determined by correlation to the concentration of the inert tracer, and the concentration of the water treatment agent indicator.

Hoots et al. teaches that these fluorescent-based methodologies are applicable to a wide variety of types of industrial water systems, for example, those involving a membrane separation system. Hoots et al., however, does not specifically describe how the techniques are implemented, but does mention the following:

> "Monitorings of membrane filtration chemicals (WTA's including without limitation treatment chemicals that enhance membrane-separation process performance, antiscalants that retard/prevent membrane scale deposition, antifoulants that retard/prevent membrane fouling, biodispersants, microbial-growth inhibiting agents such as biocides and cleaning chemicals that remove membrane deposits) to determine actual feed rates and in-system concentrations would greatly enhance the operational efficiency of the system and protect the membrane...." (Col. 12, lines 44-53).

Hoots et al. (U.S. Patent No. 5,171,450) describes a method of monitoring and dosage control of tagged polymers in cooling water systems. In particular, a fluorescent monitor is tagged to a polymer so that the polymer can be monitored in the cooling water system. An inert fluorescent tracer may be added in proportion to said tagged polymer as well. System consumption of the tagged polymer can be determined by looking at the difference between the concentration of the inert fluorescent tracer and the concentration of the tagged polymer.

Applicants traverse the Examiner's rejection because not all elements of the claimed invention are taught or suggested by the prior art references. A rejection under 35 U.S.C. §103 requires that all elements of the invention are taught or suggested by the cited prior art references. The prior art references do not teach or suggest a method of monitoring a membrane separation process where there is the step of selecting an inert fluorescent tracer and a tagged fluorescent agent, wherein the selection is made such that it is known in advance whether said inert fluorescent tracer and tagged fluorescent agent are capable of traveling through the membrane into the permeate stream either separately or together, or not capable of passing through the membrane into the permeate stream either separately or together.

The Examiner argument relies on the premise that Hoots (U.S. Patent No 5,435,969) teaches element C. Applicants rebut this premise. The following argument provides support for a finding that Hoots does not (a) explicitly or (b) inherently disclose the step of selecting an inert fluorescent tracer and tagged fluorescent agent, wherein the selection is made such that it is known in advance whether said inert fluorescent tracer and said tagged fluorescent agent are: (i) capable of traveling through the membrane into the permeate stream, or (ii) not capable of passing through the membrane into the permeate stream.

a. No Explicit Disclosure

Hoots does not explicitly disclose the step of selecting an inert fluorescent tracer and tagged fluorescent agent, wherein the selection is made such that it is known in advance whether said inert fluorescent tracer and said tagged fluorescent agent are: (i) capable of traveling through the membrane into the permeate stream, or (ii) not capable of passing through the membrane into the permeate stream, because the text of Hoots does not mention this verbatim.

b. No Inherent Disclosure

Hoots does not inherently disclose the step of selecting an inert fluorescent tracer and tagged fluorescent agent, wherein the selection is made such that it is known in advance whether said inert fluorescent tracer and said tagged fluorescent agent are: (i) capable of traveling through the membrane into the permeate stream, or (ii) not capable of passing through the membrane into the permeate stream, because the selection step does not necessarily flow from the prior art references; at best the prior art references only show a mere probability or possibility that a selection step exists and that is not sufficient for inherency.

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy,* 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original); MPEP 2112. "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson,* 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted)"; MPEP 2112.

The Examiner appears to make an assumption that the element of selecting an inert fluorescent tracer and tagged fluorescent agent, wherein the selection is made such that it is known in advance whether said inert fluorescent tracer and said tagged fluorescent agent are: (i) capable of traveling through the membrane into the permeate stream, or (ii) not capable of passing through the membrane into the permeate stream, is inherent in the prior art reference. The reasoning appears to rely on three premises.

The first premise relies on the relationship between selection based upon consumption and degradation and selection based upon passage through a membrane.

The second premise relies on the relationship between selection based upon solubility and dispersability and selection based upon passage through a membrane.

Applicants rebut both premises based upon the following reasons.

With respect to the first premise, consumption and degradation of an inert fluorescent tracer and tagged fluorescent agent in a membrane separation system is different from passage/transportability of an inert fluorescent tracer and tagged fluorescent agent through a membrane separation system because consumption/degradation and passage/transportability are different concepts. A tracer can be inert (e.g. not be consumed or degraded) and not pass through a membrane. A tagged fluorescent agent can not be consumed or degraded and not pass through a membrane. Thus, the concepts are completely different. There is no one to one correlation between the two factors; one factor does not flow from another factor. Moreover, at best the fact that there is no consumption/degradation makes it a mere probability or possibility that a tracer/tagged fluorescent agent will pass through a membrane. Applicants, therefore, submit that this element at issue is not inherent because passage/transportability of inert fluorescent tracer/tagged fluorescent agent does not necessarily flow from consumption/degradation and it is not clear from the prior art reference that the missing descriptive matter is necessarily present in the thing described in the reference.

With respect to the second premise, solubility/dispersability of a molecule does not automatically mean that an inert fluorescent tracer/tagged flourogenic agent can pass through a membrane. Various other factors of inert fluorescent tracer/tagged fluorescent agent molecule, e.g. conformation, charge, molecular weight, and hydrophobicity, may impact the ability of a fluorescent tracer/tagged flouregenic agent to pass through a membrane. In essence there is no one to one correlation that can be extrapolated between solubility/dispersability and the ability of an inert fluorescent tracer/tagged flourogenic agent to pass through a membrane; one factor does not flow from another factor. At best, having a tracer/tagged flourogenic agent that is dispersable/soluble makes it a "mere probability or possibility" that a tracer will pass through a membrane. Applicants, therefore, submit that this element at issue is not inherent because passage/transportability of inert fluorescent tracer/tagged flourogenic agent does not necessarily flow from solubility/dispersability and it is not clear from the prior art reference that the missing descriptive matter is necessarily present in the thing described in the reference.

In view of the foregoing, Applicants request that this rejection be removed and that claims 1,2 and 6-18 be allowed.

b. Hoots in view of Hoots and Al-Samadi

Claims 3-5 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Hoots et al. (U.S. Patent No. 5,435,969) in view of Hoots (U.S. Patent No. 5,171,450) and further in view of Al-Samadi (U.S. Patent No. 6,113,797).

Applicants traverse the Examiner's rejection.

Hoots et al. (U.S. Patent No. 5,435,969) teaches a method of fluorometrically monitoring the amount of water treatment agent(s) added to and in an industrial water system, as well as system consumption of water treatment agent(s) in an industrial water system.

With respect to the amount of water treatment agent(s) added to and in an industrial water system, Hoots et al. teaches that the concentration of a water treatment agent in an industrial water system can be calculated by monitoring an inert fluorescent tracer, which is added to the industrial water system in proportion to the amount of water treatment agent. Because the inert fluorescent tracer and water treatment agent are added in known proportion to one another, the concentration of the inert fluorescent tracer can be correlated with the concentration of the water treatment agent. Hoots et al. also teaches how the concentration of water treatment agent can be determined by use of a water treatment concentration indicator. Combining a water treatment agent and incipient reagent forms a concentration indicator. The concentration indicator is fluorescent and therefore its concentration can be determined by fluorometric means. The concentration of the concentration indicator is then correlated with amount of water treatment agent.

With respect to system consumption of water treatment agent, Hoots et al. teaches that system consumption of a water treatment agent in an industrial water system can be determined by monitoring a water treatment concentration indicator in conjunction with an inert fluorescent tracer. System consumption is determined by the difference between the concentration of the water treatment agent added to the system, as determined by correlation to the concentration of the inert tracer, and the concentration of the water treatment agent indicator.

Hoots et al. teaches that these fluorescent-based methodologies are applicable to a wide variety of types of industrial water systems, for example, those involving a membrane separation system. Hoots et al., however, does not specifically describe how the techniques are implemented, but does mention the following:

> "Monitorings of membrane filtration chemicals (WTA's including without limitation treatment chemicals that enhance membrane-separation process performance, antiscalants that retard/prevent membrane scale deposition, antifoulants that retard/prevent membrane fouling, biodispersants, microbial-growth inhibiting agents such as biocides and cleaning chemicals that remove membrane deposits) to determine actual feed rates and in-system concentrations would greatly enhance the operational efficiency of the system and protect the membrane...." (Col. 12, lines 44-53).

Hoots et al. (U.S. Patent No. 5,171,450) describes a method of monitoring and dosage control of tagged polymers in cooling water systems. In particular, a fluorescent monitor is tagged to a polymer so that the polymer can be monitored in the cooling water system. An inert fluorescent tracer may be added in proportion to said tagged polymer as well. System consumption of the tagged polymer can be determined by looking at the difference between the concentration of the inert fluorescent tracer and the concentration of the tagged polymer.

Al-Samadi discloses a method of water purification. In particular, Al-Samadi discloses a two-stage high pressure high recovery process utilizing two reverse osmosis membrane systems intended to provide very high overall water recoveries. This system answers the need for an improved, economical process for purification of water which provides high water recoveries, even in excess of 99%, while preventing formation of scale on the RO or nanofiltration (NF) membrane surfaces, and thus prolonging the useful life of such membranes.

Applicants traverse the Examiner's rejection because not all elements of the claimed invention are taught or suggested by the cited prior art references. A rejection under 35 U.S.C. §103 requires that all elements of the invention are taught or suggested by the prior art references. The prior art references do not teach or suggest a method of monitoring a membrane separation process where there is the step of selecting an inert fluorescent tracer and a tagged fluorescent agent, wherein the selection is made such that it is known in advance whether said inert fluorescent tracer and tagged fluorescent agent are capable of traveling through the membrane into the permeate stream either separately or together, or not capable of passing through the membrane into the permeate stream either separately or together.

Therefore, Applicants request that the Examiner removes this basis for rejection and allow claims 3-5.

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CONCLUSION

Applicants respectfully request that a Notice of Allowance be sent for all pending claims.

Respectfully Submitted,

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